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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,626	06/20/2001	Hans Bruggemann	10537/126	4532

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EXAMINER

NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
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3748

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DATE MAILED: 01/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/885,626

Applicant(s)

Bruggemann et al.

Examiner

Tu M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6 20) ☐ Other: _____

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

- Page 7, line 9, --46-- should be inserted following "catalyst".

- Page 7, line 10, --48-- should be inserted following "muffler".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Peter-Hoblyn et al. (U.S. Patent 6,003,303).

As shown in Figure 1, Peter-Hoblyn et al. disclose an emission control system and a method for operating such system. The system comprises:

- a particle filter (30); and

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- an arrangement disposed upstream from the particle filter, the arrangement being configured to prevent development of ash-forming compounds of sulfur contained in an exhaust gas. A platinum group catalyst metal composition and an auxiliary catalyst metal composition are introduced into the fuel, exhaust gas, or combustion air, which are all located upstream of the particle filter, in order to lower the balance point of the particle filter (lines 30-55 of column 8). Thus, particulate matters can be combusted at the filter with minimal requirement of oxygen in the exhaust gas. Because of the low oxygen content in the exhaust gas, the generation of additional particulate matters from the oxidation of SO_2 to SO_3 is also reduced (lines 23-35 of column 27 and lines 17-19 of column 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al. (U.S. Patent Application Publication 2001/0035006) in view of Araki et al. (U.S. Patent 5,850,735).

Re claims 1, 9, 12, and 13, as shown in Figure 17, Dou et al. disclose an emission control system, a method for operating such system, and a method and a device for reducing ash components in a particle filter of an exhaust system for a diesel engine. The device comprises a catalyst (3) disposed upstream from the particle filter (6),

wherein the catalyst (3) including a sulfur-storing catalyst configured as a NO_x collector (paragraphs 0039 and 0044 on page 3), and

wherein the catalyst (3) being further configured to adsorb sulfur species in a fuel lean and low temperature environment; and to desorb the sulfur species in a fuel rich and high temperature environment.

Dou et al., however, fail to disclose the mechanism of sulfur adsorption and desorption in the catalyst (3), and how to minimize the production of sulfur particulate matters which can clog up the filter.

Araki et al. teach a method for purifying exhaust gas, that clearly describes in detail the mechanism of absorption and desorption of sulfur species in a SO_x absorbent (5) (lines 5-57 of column 7). In a lean environment, sulfur is absorbed by an absorbent layer of the SO_x absorbent in the form of a SO₄ sulfate. In a fuel rich and high temperature environment, SO₄ is desorbed from the absorbent layer to become either SO₂ (gas state) or SO₃ (solid state). During the

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desorption of sulfur, Araki et al. selectively raise the exhaust gas to a temperature above a predetermined value and lower the oxygen content in the exhaust gas to minimize the conversion of SO_4 to SO_3 (see Figures 2 and 3). In this way, the amount of particulate matters released into the atmosphere can be maintained at a low level. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the method taught by Araki et al. in the system, methods, and device of Dou et al., since the use thereof would have minimized the generation of sulfur particulate matters which can clog up the particle filter.

Re claim 2, in the modified emission control system of Dou et al., the emission control system is configured for use with an internal combustion engine.

Re claim 3, in the modified emission control system of Dou et al., the system includes a SO_x collector (3).

Re claims 4 and 5, in the modified emission control system of Dou et al., the system includes a NO_x collector (3).

Re claims 6-8, in the modified emission control system of Dou et al., the system includes an oxidation catalyst (3) (paragraph 0044).

Re claim 10, the modified method of Dou et al. further comprises the steps of:

- operating the emission control system in a normal operating phase with a lean exhaust composition to store sulfur contained in the exhaust gas; and
- operating the emission control system in a regeneration phase with a rich exhaust composition to release stored sulfur as at least one gaseous compound.

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Re claim 11, in the modified method of Dou et al., the step of operating the emission control system in the regeneration phase includes the substep of raising an exhaust temperature to between 550°C and 700°C (Figures 4 and 5; paragraph 0050).

Prior Art

6. The IDS (PTO-1449) filed on June 20 and December 17, 2001 have been considered. An initialized copy of each is attached hereto.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of six patents.

- Murachi et al. (U.S. Patent 5,746,989) disclose a method for purifying exhaust gas of a diesel engine.

- Modica et al. (U.S. Patent 5,916,129) disclose a control of exhaust emissions from an internal combustion engine.

- Hirota et al. (U.S. Patent 5,974,791) disclose an exhaust gas purification apparatus for an internal combustion engine.

- Hirota et al. (U.S. Patent 6,199,374) disclose an exhaust gas purification apparatus for an internal combustion engine.

- Hoffmann et al. (U.S. Patent Application Publication 2001/0052232) disclose a method for removing NO_x and particulates from lean exhaust gas of an internal combustion engine.

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- Hirota et al. (Japan Patent 6-272541) disclose an exhaust gas purification device for internal combustion engine.

Communication

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 308-7763.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.

TMN

January 22, 2002

Tu M. Nguyen

Tu M. Nguyen

Patent Examiner

Art Unit 3748

Thomas Denion
THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may **NOT** be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a)

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.